Given to Rob Avery
for Review 2/5/04
Discussed 2/10
Comments to Anthony 2/11

WORKPLAN TO PERFORM A PILOT EXCAVATION

L.E. CARPENTER & COMPANY
WHARTON, NEW JERSEY
USEPA ID NO. NJD002168748

February 2004

Walter M. Kurzeja
Director of Construction Operations

Daniel E. Oman, P.E.
Certifying Engineer

Nicholas J. Clevett
Project Manager

Drew F. Diefendorf, C.P.G.
Project Technical Coordinator

FINAL

Table of Contents

List of Tables

List of Figures

Section 1
Introduction

1.1 Background

To evaluate potential remedial approaches for the L.E. Carpenter & Company (LEC) site ("the site"), RMT in December 2001, installed three (3) exploratory test pits and collected samples. Based on field subsurface conditions (*e.g.*, large cobbles and boulders, hydraulics, and the discovery of additional source material (process wastes), the overall remedial approach for light nonaqueous-phase liquids (LNAPL) focused on source reduction via excavation. This proposed remedial approach was outlined in the report entitled *Findings and Recommendations Regarding a Conceptual Free-Product Remediation Strategy* (RMT, March 2002). In this conceptual remedial approach RMT outlined a number of issues that would affect the design details for implementation of the recommended source (lead soils and free product) removal strategy.

Following the meeting of October 7, 2003 among NJDEP, USEPA, LEC, and RMT, the decision was made to excavate and dispose off-site the lead soils (as outlined in the 1994 ROD) rather than reuse this material as subsurface fill as proposed in the report entitled *Focused Feasibility Study Lead Impacted Soil Remediation* (RMT, February 2003). As a result, preparation of a Remedial Action Work Plan (RAWP) outlining the details of the source removal strategy (both lead soils and free product) was deemed the next critical path item required to implement the conceptual remedial approach.

While the *Findings and Recommendations Regarding a Conceptual Free-Product Remediation Strategy* determined excavation to be feasible and the information was sufficient to evaluate various excavation scenarios, details regarding the final design for the approach have not been established. These design issues generally include (1) the elements related to proposed excavation operations as well as (2) factors affecting management and disposal of generated waste streams and (3) overall site logistics and construction management. To more thoroughly evaluate these design factors, RMT will conduct an in-field, excavation pilot test and materials/waste analysis evaluation as outlined below.

1.2 Data Objectives

A number of critical issues must be verified to fine tune the overall source reduction methodology prior to RAWP preparation and full-scale site implementation. These three critical issues are: (1) excavatability and benching/draining of the soils with concurrent recovery of LNAPL within the excavation from the surrounding groundwater, (2) excavation area vapor migration, control and project health and safety requirements, and (3) potential soils amendment

requirements (*e.g.*, calciment, lime, or pozzolon mixtures *etc.*) to facilitate residual free liquids removal after in excavation benching and free liquid draining is complete.

There are also specific waste management issues that require evaluation and resolution prior to RAWP preparation and remedial implementation to facilitate efficient removal, transportation and off-site management of the various waste streams outlined in the *Findings and Recommendations Regarding a Conceptual Free-Product Remediation Strategy* (RMT, March 2002). Specifically, waste samples will be analyzed at various points in the remedial process by both RMT's Applied Chemistry Group and select disposal facilities to determine material augmentation requirements (if applicable), potential augmentation material effects on waste characteristics, and waste management contractual requirements (*e.g.*, costs, paperwork, volumetric requirements/restrictions *etc.*).

Finally, the various facets associated with site remedial logistics and construction management need to be further evaluated. Issues such as security, local contingency response, material and equipment lay down, site access and egress routes and traffic control need to be clearly defined in the RAWP and know prior to implementation. RMT intends to gain the required information to assess these critical issues by performing a pilot excavation. Full scale implementation of the source removal strategy and development of on-site remedial contingencies will be less problematic and accomplished most easily if (1) the excavatability, stability, and drainability of the soil, specifically the saturated portion of the smear zone, are clearly understood; (2) if problematic, vapor control can be readily applied with known technologies and agents; and (3) if any excess free product can be recovered so that it does not contaminate clean zones or backfill during excavation. In the interest of fast-tracking the implementation of a preferred alternative, RMT proposes to collect the data needed including that necessary to evaluate solidification agents. The actual collection of data will be undertaken in the field by RMT construction and engineering personnel. The final remedial approach will be based upon field observations and experience.

Section 2
Scope of Work

2.1 Pilot Excavation and Evaluation of Design Criteria

To achieve the objectives outlined in Section 1.2, RMT will excavate test pits within two areas of the free-product zone on the site at the locations shown on Figure 1. From the information obtained RMT will finalize the technical details and approach to be presented in the Remedial Action Work Plan (RAWP).

Test pits will be excavated to the lower vertical extent of the free product smear zone (approximately 12 feet below ground surface (bgs) and potentially 2 feet below water table) to evaluate soil conditions and properties representative of the unsaturated, product-smear and water/product-saturated zones.

2.1.1 Excavation Design

Physical excavation methodologies will be explored that will aide in determining potential excavation difficulties and their solutions. Evaluations will include but are not limited to:

- excavation geometry such as benching, side-wall stability and subgrade staging area needs (*e.g.*, excavation bench)
- determination of the presence, location, volume and removal requirements for the former Building 14 foundation and associated demolition debris
- special equipment type needs (*e.g.*, screens, containers, pumps, roll-off boxes *etc.*)
- material handling procedures and equipment sizing
- excavation/remedial sequencing
- dust control needs and methodologies to minimize release of contaminant-laden dust from excavation operations and exposed soil surfaces

2.1.2 Excavation and Material Dynamics

Soil saturation, moisture content and free-product conditions will be observed and evaluated to:

- determine hydraulic and product behavior of the impacted stratigraphic zones encountered
- visually estimate stratigraphic volumes of material exceeding 2.5-inch diameter

- determine bench areas necessary to temporarily place materials for drainage and the time necessary to drain excess fluids
- measure the impact of potential vapors released upon exposure of the excavated saturated materials by obtaining a PID and explosimeter readings inside the excavation and placement of high volume samplers at 50 and 100 feet from the excavation and at the property line or edge of the potential support zone and down wind of the excavation
- determine levels of personal protection required to work on the site.
- define the on-site work zones
- evaluate the potential and logistical needs or limitations for any vapor suppressants

2.1.3 Free Product (LNAPL) Dynamics

Free product fluid recovery designs and needs will be evaluated by:

- Placing an absorbent boom in the trench immediately after the excavation is performed and leaving it in place until the next morning
- Estimating the potential thickness of free product smear zones and the potential thickness of floating product that may occur
- Observing the degree to which any free product released from the soil is in an emulsified state
- Perform tests utilizing hydrocarbon recovery agents such as Plastisol (or equivalent) to determine product recovery capabilities. None of these hydrocarbon recovery agents will be utilized *in-situ*.

2.2 Material Characterization and Management Testing

To effectively manage the various waste materials to be excavated, the design for the remedial approach must consider issues such as waste characterization (liquid and solid), augmentation (type and amount of augmentation materials), and transportation and disposal requirements. A determination regarding the application of historical waste codes at the LEC site during remediation was received on September 10, 2002 from USEPA and NJDEP (*i.e.*, elimination of F003, F005 and U028 codes from the free product and subsequently the free product saturated soils). RMT needs to gather additional data regarding the physical behavior of the free product saturated soils (Category D ~ Free Product Smear Zone Soils) once they are excavated and stockpiled or placed in the truck for hauling off-site.

During execution of this task RMT will select 3 sets of product-saturated as well as bench drained soil samples from each test excavation; collect each in 5-gallon storage containers; and perform on-site augmentation and vapor suppressant testing as follows:

- Establish waste material analytical requirements
- Determine pre- and post- soil drainage moisture content analyses
- Perform a waste characterization of the field-drained Category D soils before augmentation with any material additive to determine characteristics (physical, organic and inorganic)
- Perform laboratory grain-size distribution analysis of <2.5- inch soil fractions obtained
- Select augmentation materials compatible with Category D soils (*i.e.*, lime, Calciment, or Portland cement)
- Evaluate the ability of various augmentation materials to mix with and remove any remaining free-liquids in the bench drained Category D soils
- Determine the appropriate percentage of the selected augmentation material to enable the Category D soils to pass the paint filter test (free liquids analysis for transportation and disposal pricing)
- Evaluate any potential compatibility and impact of proposed vapor suppressants on waste stabilization, and characterization, transportation and disposal.
- Perform a waste characterization of (1) Category D soils after augmentation and with any material additives and/or vapor suppressants, and (2) Category B process material to determine waste characteristics and firm-up TSD facility waste management and disposal requirements.

2.3 Site Logistics and Construction Management Issues

Several strategic site issues relating to implementation of the remediation program will need to be resolved to complete the RAWP. During the installation of the pilot excavations, RMT will perform a thorough reconnaissance of the site to address among other things:

- Site access and egress routes and traffic control needs
- Site security and fencing, including how to handle the rails-to-trails corridor during remediation
- Placement of stock piles and staging areas outside of the excavation area;
- Site grading, erosion control and potential wetland mitigation issues along the Rockaway River corridor
- Establish air- and dust-monitoring locations if the data gathered from performing the evaluation outlined in Section 2.1.2 Bullet 4 warrant such action

A breakdown of pilot test tasks and associated data objectives is outlined in Table 1. A flow diagram and decision tree outlining the details, data needs and decision flow of the pilot test is presented in Figure 2.

Section 3
Schedule

We anticipate performing the test pilot for this project starting on or about February 16, 2004. RMT anticipates the test will take between 3 and 6 days to perform depending on the weather and day-to-day results. RMT will perform data analysis and incorporate the findings as part of the detailed Remedial Action Work Plan proposed for submittal on or before April 30, 2004.

Tables

TABLE 1
L.E. Carpenter & Company
Pilot Test Excavation Task and Objectives[1]

TESTING PHASE	TASK OR ANALYSIS	OBJECTIVE
Pilot Excavations	1. Excavate test pits 2. Observe and Log Excavation, Trench stability and Site Stratigraphy 3. Construct a soils bench in each excavation to aid in free liquid draining 4. Select 3 sets of soil samples from each pit and collect in 5-gallon storage containers	1. Determine geotechnical limitations on excavation and equipment 2. Determine hydraulic and product behavior of stratigraphic zones encountered 3. Provide sufficient representative volumes of soils and product samples for subsequent laboratory analyses and materials augmentation tests
Product Recovery Tests	1. Simulate excavation in the smear zone. 2. Place absorbent boom in trench immediately after excavation is performed and leave in place until the next morning. 3. Perform ex-situ tests with hydrocarbon recovery agents (Plastisol)	1. Evaluate extent of emulsification 2. Determine free-product recovery & augmentation potential
Vapor Release Testing	1. Place high volume samplers immediately downwind from the excavation, at 50 and 100 feet from the excavation and at the property line or edge of the potential support zone.	1. Determine if undesirable vapors, or other toxic byproducts will be liberated during excavation. 2. Determine levels of personal protection required to work on the site. 3. Determine work zones
Pre Augmentation Waste Materials Analysis	1. Perform chemical and physical waste profile analysis pre augmentation	1. Determine drainable percentage of free product 2. Determine relative permeability 3. Determine trench stability 4. Determine soil clogging potential 5. Determine treatability of soil 6. Provide pre augmentation baseline data
Soils Augmentation	1. Perform augmentation tests	1. Determine augmentation material dosage for free liquids removal
Post Augment Waste Materials Analysis	1. Perform chemical and physical waste profile analysis post augmentation	1. Provide a representative sample for waste characterization and off-site disposal

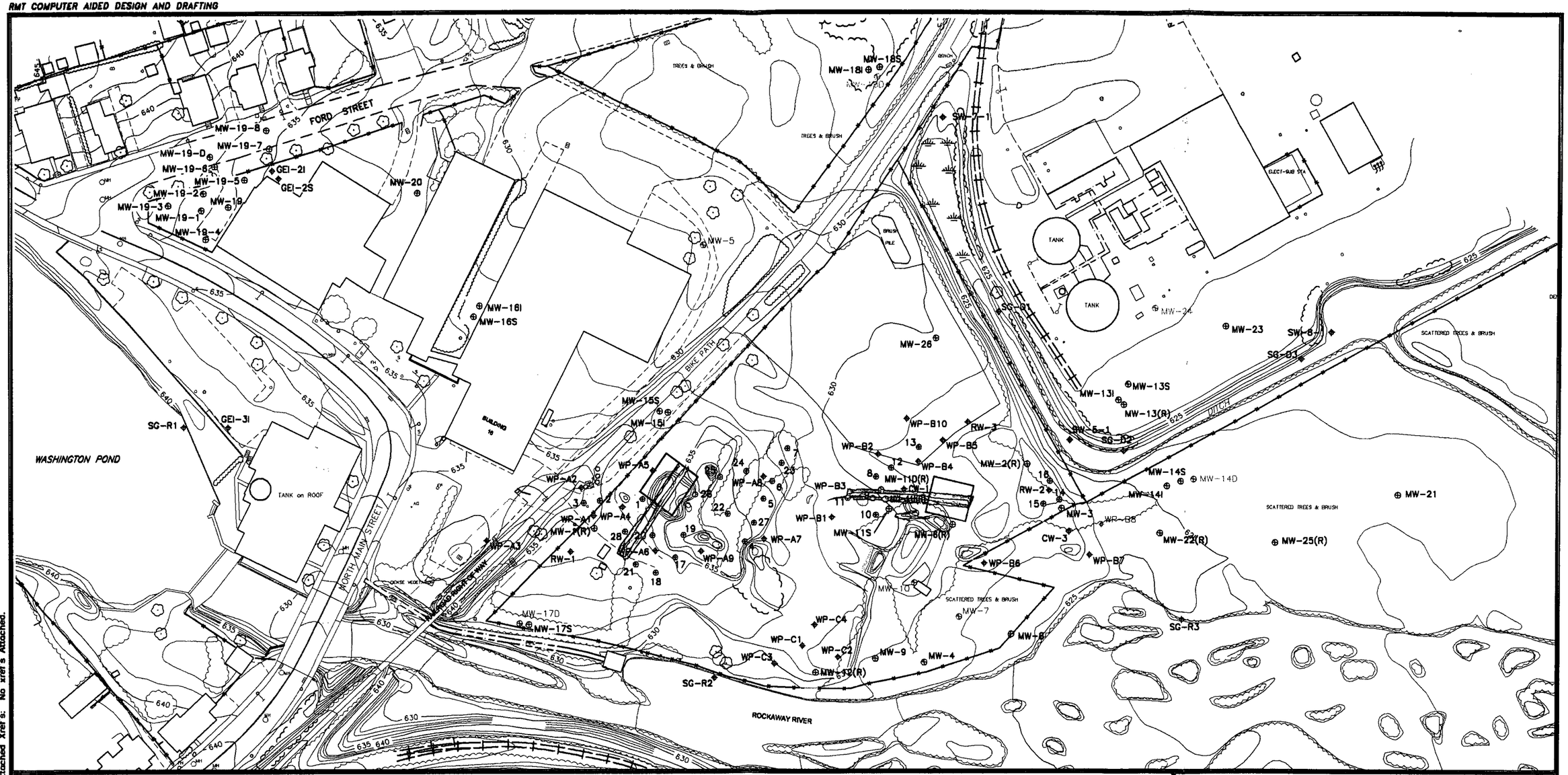
[1] The extent and applicability of all tests will be made in the field based upon field observations and the experience of RMT's on site construction and engineering personnel.

Figures

Figure 1: Site Plan with Test Excavation Locations

Figure 2: Pilot Excavation Decision Tree and Flow Diagram

RMT COMPUTER AIDED DESIGN AND DRAFTING



LEGEND

———	PROPERTY LINE	◆ WP-B7	WELL POINTS
——+——	FENCE	◆ SG-R1	RIVER POINT
⊕ MW-21	MONITORING WELL	◆ SG-D1	DRAINAGE CHANNEL POINT
⊕ MW-24	ABANDONED WELL	◆ GEI-2I	PIEZOMETERS
⊕ 13	ENHANCED FLUID RECOVERY WELL	▣ SW-7-1	SURFACE WATER SAMPLE
◆ RW-2	RECOVERY WELL	▭	PILOT EXCAVATIONS (ACTUAL EXCAVATION SIZE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS
◆ CW-3	CAISSON WELLS		

② Needed to be overlaid on top of product thickness plots/maps.
② trench into thicker product areas to achieve objectives
discussed with Rob Alter 2/10

N

0 100' 200'
SCALE IN FEET

I.E. CARPENTER
WHARTON, NEW JERSEY

PROPOSED PILOT EXCAVATION LOCATION

DRAWN BY:	SJL	PROJECT NUMBER:	6527.01
CHECKED BY:	NC	FILE NUMBER:	65270101.DWG
APPROVED BY:	NC	DATE:	JANUARY 2004

RMT INC.
1143 HIGHLAND DRIVE, SUITE B
ANN ARBOR, MI. 48108-2237
PHONE: 734-971-7080
FAX: 734-971-9022

FIGURE 1

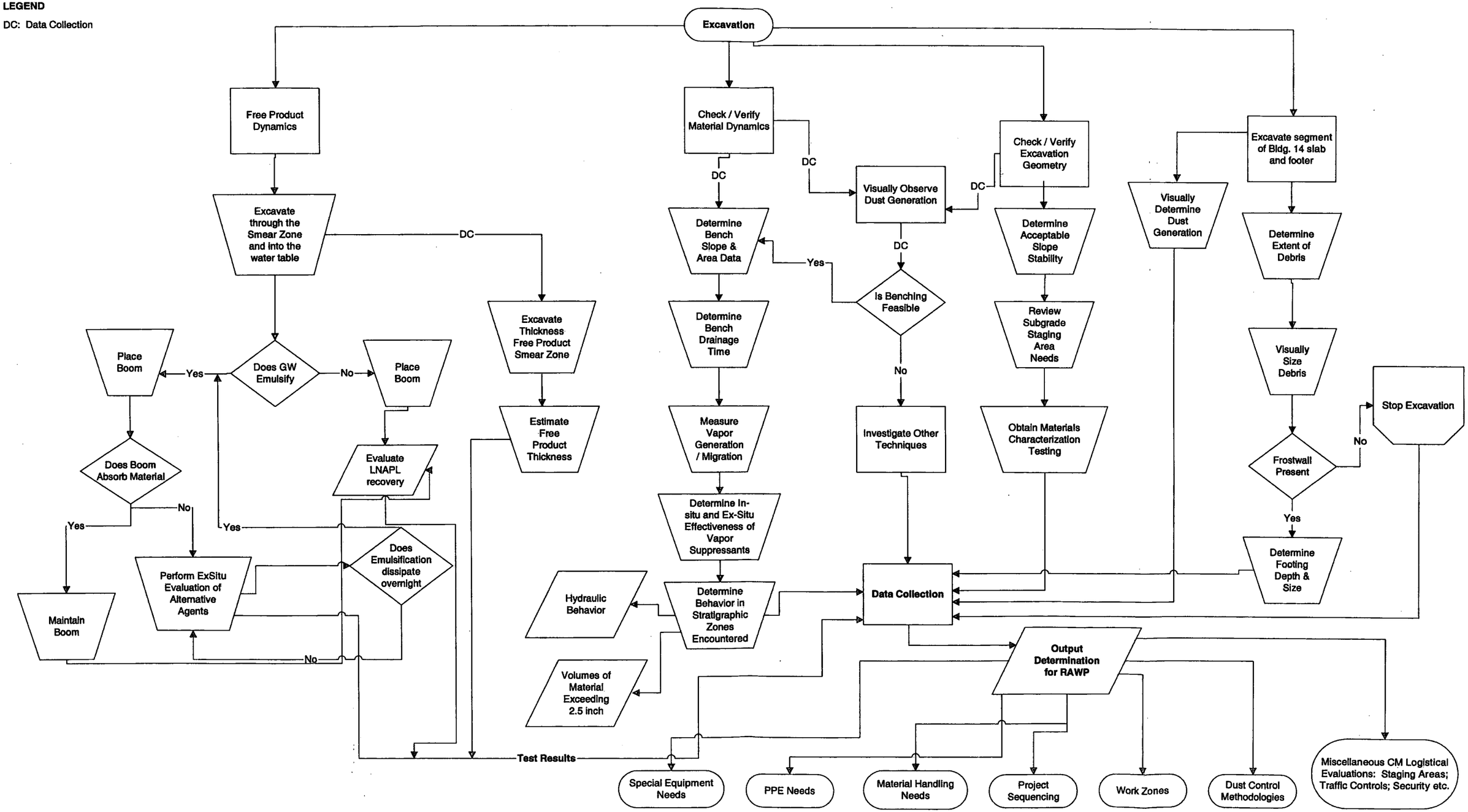
PLOT DATA
Drawing Name: J:\06527\01\65270101.dwg
Operator Name: lucidos
Scale: SHOWN
Layout Name: Proposed Pilot Excavations

Dwg Size: 1000555 Bytes
Plot Date: Tuesday, January 27, 2004
Plot Time: 08:08:49:58 AM
Attached Xref's: No xref's Attached.

FIGURE 2
L.E. Carpenter& Company - NJD002168748
Pilot Excavation Decision Tree & Flow Diagram

LEGEND

DC: Data Collection



I:\WPGRM\PJT\00-06527\01\Figure 2.vsd